IN THE CLAIMS:

Set forth below in ascending order, with status identifiers, is a complete listing of all claims currently under examination. Changes to any amended claims are indicated by strikethrough and underlining. This listing also reflects any cancellation and/or addition of claims.

Claim 1 (cancelled)

Claim 2 (previously presented)

The actuator of claim 15, wherein the myosin comprises myosin S1 or heavy meromyosin.

Claim 3 (previously presented)

The actuator of claim 15, wherein the movable member is a rod having a longitudinal dimension of about 100 nm to about 100 μm and a cross sectional dimension of about 20 nm to about 200 nm.

Claim 4 (previously presented)

The actuator of claim 15, wherein the movable member is curved.

Claim 5 (previously presented)

The actuator of claim 15, wherein the movable member comprises nickel, palladium, gold, platinum, cobalt, permalloy, chromium, or a combination thereof.

Claim 6 (previously presented)

The actuator of claim 15, wherein the movable member comprises a polymeric material.

Claim 7 (previously presented)

The actuator of claim 15 that is less than 100 μm in length in any of its 3 dimensional measurements.

Claims 8-11 (cancelled)

Claim 12 (previously presented)

The actuator of claim 15, wherein the actin/myosin interaction causes movement of the movable member along its longitudinal axis.

Claim 13 (previously presented)

The actuator of claim 12, wherein the movement of the movable member is unidirectional.

Claim 14 (previously presented)

The actuator of claim 12, wherein the movement of the movable member is bidirectional.

Claim 15 (previously presented)

An actuator, comprising:

a movable member that is coated at least in part with myosin;

two separate arrays of actin filaments that are aligned with respect to a common axis but with opposite polarities, wherein both of the arrays are positioned to interact with the myosin that is coated on the movable member; and

two separate energy-transmitting stripes that are associated with the arrays in a manner to selectively energize respective ones of the arrays, so that when one of the stripes is sufficiently energized, an actin/myosin interaction is such that the movable member is moved substantially linearly from its starting position in a direction parallel to the actin filaments within the arrays.

Claim 16 (previously presented)

The actuator of claim 15, wherein at least one of the stripes transmits heat.

Claim 17 (previously presented)

The actuator of claim 16, wherein the movable member is a rod, the arrays are arranged such that the actin filaments are parallel to the rod's longitudinal axis, and the rod is moved in a direction parallel to its longitudinal axis.

Claim 18 (previously presented)

The actuator of claim 15, wherein the actin/myosin interaction is promoted by a source of chemical potential energy.

Claim 19 (original)

The actuator of claim 18, wherein the source of chemical potential energy is a nucleoside triphosphate.

Claim 20 (original)

The actuator of claim 18, wherein the source of chemical potential energy is adenosine triphosphate (ATP) or 2'-deoxy ATP.

Claim 21 (previously presented)

The actuator of claim 15, wherein the stripes are associated with a source of energy, wherein energizing one of the stripes causes the movable member to move relative to its starting position.

Claims 22-80 (cancelled)

Claim 81 (previously presented)

A combination of at least two actuators of claim 15, wherein the actuators function in concert.

Claim 82 (previously presented)

The actuator of claim 15, wherein when another one of the stripes is sufficiently energized, the actin/myosin interaction is such that the movable member is moved substantially linearly back towards its starting position.

Claims 83-85 (cancelled)

Claim 86 (currently amended)

An actuator, comprising:

a movable member;

a first biological material positioned on at least a portion of the movable member;

a reservoir defining two orifices that are configured~~positioned so as~~ to slidingly engage~~receive~~ opposite ends of the movable member; and

a second biological material positioned within the reservoir so as to interact with the first biological material,

wherein, when the second biological material is sufficiently energized, an interaction of the first and second biological materials is such that the movable member is moved substantially linearly in a direction towards one of the orifices.

Claim 87 (previously presented)

The actuator of claim 86, wherein the movable member is a rod

Claim 88 (previously presented)

The actuator of claim 87, wherein the rod has a longitudinal dimension of about 100 nm to about 100 μm and a cross sectional dimension of about 20 nm to about 200 nm.

Claim 89 (previously presented)

The actuator of claim 86, wherein the first biological material is myosin, and the second biological material is actin.

Claim 90 (withdrawn)

The actuator of claim 86, further comprising an energy-transmitting stripe positioned so as to transmit a first type of energy to the second biological material.

Claim 91 (withdrawn)

The actuator of claim 90, wherein the first type of energy is heat, electricity, light, or electrochemical energy.

Claim 92 (withdrawn)

The actuator of claim 90, further comprising a source of a second type of energy positioned within the reservoir so as to aid the interaction of the first and second biological materials.

Claim 93 (withdrawn)

The actuator of claim 92, wherein the second type of energy is chemical potential energy.

Claim 94 (new)

The actuator of claim 86, wherein the two orifices are configured to slidingly engage the opposite ends of the movable member so as to seal a liquid that is positioned within the reservoir.